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(54) THERMOPLASTIC ELASTOMER COMPOSITION AND MOLDED ARTICLE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a thermoplastic elastomer composition which serves as a substitute for an NBR/PVC composition, has good oil resistance and is excellent in rubber elasticity and moldability, and its molded article.

SOLUTION: The thermoplastic elastomer composition is obtained by subjecting a mixture containing (A) an unsaturated nitrile-conjugated diene rubber having two or more glass transition temperatures and a content of unsaturated nitrile units of 25-50 wt.% and (B) an olefin resin to a dynamic heat treatment in the presence of a crosslinking agent.

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TECHNICAL FIELD

[Field of the Invention] This invention relates to a thermoplastic-elastomer constituent. In more detail, in the mixture containing specific unsaturated nitrile-conjugated diene system rubber and olefine resin, it excels in oil proof and rubber elasticity which are obtained by performing dynamic heat treatment under existence of a cross linking agent, and fabricating-operation nature is related with a good thermoplastic-elastomer constituent and its mold goods.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to a thermoplastic-elastomer constituent. In more detail, in the mixture containing specific unsaturated nitrile-conjugated diene system rubber and olefine resin, it excels in oil proof and rubber elasticity which are obtained by performing dynamic heat treatment under existence of a cross linking agent, and fabricating-operation nature is related with a good thermoplastic-elastomer constituent and its mold goods.

[0002]

[Description of the Prior Art] Since nitrile system rubber like acrylonitrile butadiene copolymer rubber (NBR) contains a polar group, oilproof [which was excellent to an oil of a non-polarity like hydrocarbon system oil, for example a gasoline,] is shown, but since a double bond is included in a principal chain, weatherability is inferior and an application is limited. In order to improve the weatherability of nitrile system rubber, there is an approach of mixing with a vinyl chloride system polymer (PVC) or the approach of vulcanizing the mixture, and it is mostly used on an automobile, industrial components, etc. which need current oilproof one. However, the enterprise which refrains from the activity of PVC on the grounds that it is difficult to recycle and use increases PVC, and development of the ingredient which replaces PVC is called for. After carrying out melting mixing of nitrile system rubber and the olefin system resin as one of them, there is a method of making nitrile system rubber construct a bridge. However, the olefin system resin of a non-polarity and the compatibility of the nitrile system rubber which has a polarity were very bad, and the poor appearance was looked at by mold goods, when the nitrile system rubber which constructed the bridge was distributed in olefin system resin, the distributed particle size became large

and physical properties did not improve. then, the approach of adding various compatibility-ized material devises -- having had (for example, JP,56-143233,A, JP,4-48817,B, etc.) -- although each of physical properties improves, the appearance of mold goods is not improved.

[0003]

[Problem(s) to be Solved by the Invention] It is in the object of this invention offering the thermoplastic-elastomer constituent which was made against the background of the technical problem of the above-mentioned conventional technique, and has oilproof as a substitute of a NBR/PVC constituent, and was excellent in rubber elasticity and fabricating-operation nature, and its mold goods.

[0004]

[Means for Solving the Problem] this invention persons came to complete header this invention for the thermoplastic-elastomer constituent excellent in oilproof, rubber elasticity, and fabricating-operation nature being obtained by heat-treating dynamically the mixture of specific unsaturated nitrile-conjugated diene system rubber and olefine resin under cross linking agent existence, as a result of inquiring wholeheartedly that the above-mentioned object should be attained.

[0005] The mold goods with which the following thermoplastic-elastomer constituent and it were used for this invention are offered.

[1] (A) Thermoplastic-elastomer constituent characterized by having two or more glass transition temperature, and for the content of an unsaturated nitrile unit heat-treating dynamically the mixture containing 25 - (B) olefine resin under existence of a cross linking agent with the unsaturated nitrile-conjugated diene system rubber which is 50 % of the weight, and obtaining it.

[2] A thermoplastic-elastomer constituent given in the above [1] which the unsaturated nitrile-conjugated diene system rubber 50 (above-mentioned [A]) - 50 - 5 % of the weight (correcting the total quantity of (A) and (B) is 100 % of the weight) of 95-% of the weight and (B) olefine resin come to contain.

[3] The unsaturated nitrile-conjugated diene system rubber (above-mentioned [A]) is a thermoplastic-elastomer constituent the above [1] characterized by consisting of unsaturated nitrile-conjugated diene system rubber (b) whose content of an unsaturated nitrile unit is 30 - 70 % of the weight, and unsaturated nitrile-conjugated diene system rubber (b) whose content of an unsaturated nitrile unit is 5 - 25 % of the weight, or given in [2].

[4] The rate of the above-mentioned unsaturated nitrile-conjugated diene system rubber (**) and unsaturated nitrile-conjugated diene system rubber (**) is a thermoplastic-elastomer constituent given in the above [3] characterized by being a weight ratio (**) /(**) and being 1.5-20.

[5] For the unsaturated nitrile-conjugated diene system rubber (above-mentioned [A]), the methyl-ethyl-ketone insoluble matter in 23 degrees C is a thermoplastic-elastomer constituent given in 10 - above-mentioned [which are characterized by being 95%] [1] - [4].

[6] The above [1] Mold goods which come to contain the thermoplastic-elastomer constituent of a publication in any 1 term of - [5].

[0006]

[Embodiment of the Invention] Hereafter, the gestalt of operation of the thermoplastic-elastomer constituent of this invention is explained concretely. The thermoplastic-elastomer constituent of this invention has the glass transition temperature beyond (A)2 **, and it is characterized by the thermoplastic-elastomer constituent with which the content of an unsaturated nitrile unit is characterized by heat-treating dynamically the mixture containing

25 - (B) olefine resin under existence of a cross linking agent with the unsaturated nitrile-conjugated diene system rubber which is 50 % of the weight, and being obtained. Hereafter, it explains still more concretely for every configuration.

[0007] The (A) unsaturated nitrile-conjugated diene system rubber used for unsaturated nitrile-conjugated diene system rubber this invention has two or more glass transition temperature, and is unsaturated nitrile-conjugated diene system rubber (henceforth "(A) component") whose content of an unsaturated nitrile unit is 25 - 50 % of the weight.

[0008] The (A) unsaturated nitrile-conjugated diene system rubber of this invention is copolymerization rubber by which hydrogenation was carried out selectively, after carrying out the polymerization of copolymerization rubber with the copolymeric monomer of the copolymerization rubber of conjugated diene and unsaturated nitrile, and the polar-group content of those other than conjugated diene, unsaturated nitrile, and unsaturated nitrile, and/or a polyfunctional partial saturation monomer, or these.

[0009] (A) As conjugated diene (henceforth "a component (a-1)") which constitutes a component A butadiene, an isoprene, 1, 3-hexadiene, 2-methyl-1,3-butadiene, 2, 3-dimethylbutadiene, 2-trimethoxysilyl-1,3-butadiene, 1,3-pentadiene, 2, and 4-dimethyl-1,3-butadiene etc. can be mentioned, and a kind independent or two sorts or more can be mixed and used among these. Among these, especially a butadiene and an isoprene are desirable.

[0010] (A) As unsaturated nitrile (henceforth "a component (a-2)") which constitutes a component, acrylonitrile, a methacrylonitrile, ethyl acrylonitrile, isopropyl acrylonitrile, chloro acrylonitrile, fluoro acrylonitrile, etc. are mentioned, and especially acrylonitrile is desirable.

[0011] (A) As an example of the copolymeric monomer (henceforth "a component (a-3)") of the polar-group content of those other than the unsaturated nitrile which constitutes a component A methyl acrylate, an ethyl acrylate, acrylic-acid n-propyl, acrylic-acid isopropyl, Acrylic-acid n-butyl, acrylic-acid t-butyl, acrylic-acid s-butyl, Acrylic-acid 2-methylbutyl, acrylic-acid 3-methylbutyl, acrylic-acid n-hexyl, Acrylic-acid n-heptyl, acrylic-acid n-octyl, 2-ethylhexyl acrylate, Acrylamide, N-hydroxymethyl (meta) acrylamide, N-(2-hydroxyethyl) (meta) acrylamide, N and N-bis(2-hydroxyethyl) (meta) acrylamide, 2-hydroxyethyl (meta) acrylate, 2-hydroxypropyl (meta) acrylate, crotonic-acid 2-hydroxyethyl, Crotonic-acid 2-hydroxypropyl, cinnamic-acid 2-hydroxyethyl, Cinnamic-acid 2-hydroxypropyl, crotonic-acid N-hydroxy methylamide, A crotonic-acid N-(2-hydroxyethyl) amide, cinnamic-acid N-hydroxy methylamide, A cinnamic-acid N-(2-hydroxyethyl) amide, allyl alcohol, o-hydroxystyrene, m-hydroxystyrene, p-hydroxystyrene, Ethylene glycol monochrome (meta) acrylate, propylene glycol monochrome (meta) acrylate, A vinyl amine, allylamine, o-amino styrene, m-amino styrene, p-amino styrene, 2-aminoethyl (meta) acrylate, 2-aminopropyl (meta) acrylate, Glycidyl (meta) acrylate, allyl glycidyl ether, an acrolein, A vinyl methyl ketone, divinyl phthalate, diallyl phthalate, NN-methylenebis (meta) acrylamide, N and N-ethylene bis(meta) acrylamide, NN-hexa methylenebis (meta) acrylamide, An acrylic acid, a crotonic acid, a cinnamon acid, an itaconic acid, a maleic acid, (Meta) Fumaric-acid, citraconic-acid, mesaconic acid, and acrylic-acid (meta) 2-hydroxyethyl, Acrylic-acid and methacrylic-acid 2-hydroxy butyl, acrylic-acid (meta) 2-hydroxyethyl, (Meta) Acrylic-acid 2-hydroxy butyl, 2-hydroxypropyl acrylate (meta), (Meta) Acrylic-acid dimethylaminoethyl, an acrylic-acid (meta) diethylaminoethyl, (Meta) omega-carboxy-poly caprolactone monochrome (meta) acrylate, tetrahydrofurfuryl acrylate, The di(meth)acrylate of the polyalkylene glycol (the alkylene glycol number of unit is 2-23) of a polyethylene glycol, The di(meth)acrylate of the polyalkylene glycol (the alkylene glycol number of unit is 2-23) of a polypropylene glycol etc. can mention. A kind independent or two sorts or more can be

mixed and used for these monomers. Among these [especially], an acrylic acid, an ethyl acrylate, acrylic-acid n-butyl, acrylic-acid t-butyl, and acrylic-acid s-butyl are desirable.

[0012] (A) The content of the component (a-1) in a component is 20 - 70 % of the weight more preferably 15 to 75% of the weight, when it is made into (a-1)+(a-2)+(a-3) =100 % of the weight. (a-1) Be in the inclination for the rubber elasticity of the thermoplastic-elastomer constituent with which the content of a component is eventually obtained at less than 15 % of the weight to fall. On the other hand, when it exceeds 75 % of the weight, it is in the inclination for oilproof [of the thermoplastic elastomer obtained eventually] to get worse. [0013] (A) The content of the component (a-2) in a component is 30 - 45 % of the weight more preferably 25 to 50% of the weight. (a-2) The content of a component is in the inclination for oilproof [of the thermoplastic-elastomer constituent obtained eventually] to fall to less than 25% of the weight of a case. On the other hand, when the content of a component (a-2) exceeds 50 % of the weight, there is a possibility that the rubber elasticity of a thermoplastic-elastomer constituent may fall eventually.

[0014] (A) The content of the component (a-3) in a component is 0 - 50 % of the weight more preferably zero to 60% of the weight. (a-3) When the content of a component exceeds 60% of the weight, be in the inclination for the rubber elasticity of the thermoplastic elastomer obtained eventually to fall.

[0015] The copolymerization rubber of the (A) component of this invention can carry out copolymerization of the polyfunctional partial saturation monomer to the above-mentioned (a-1) component, a component (a-2) or a component (a-1) and a component (a-2), and a component (a-3). A polyfunctional partial saturation monomer (henceforth "(X) component") has the vinyl group in which two or more radical polymerizations are possible in 1 molecule, and a polymerization is possible for it at the usual emulsion polymerization. For example, many allyl compounds, a methacrylate compound, a divinyl compound, a bismaleimide compound, an OKIIMU compound, etc. are mentioned. As an example of a polyfunctional compound, for example Triallyl isocyanurate, Trimethylolpropane trimethacrylate, N, and N'-m-phenylene bismaleimide, Ethylene glycol dimethacrylate, 1,3-butanediol JIMETA acrylate, 1,4-butanediol JIMETA acrylate, 1,6-hexanediol JIMETA acrylate, Poly ethylene glycol dimethacrylate, 1,4-butanediol diacrylate, A 1,6-hexanediol diacrylate, 2, and 2'-bis(4-methacryloyl diethoxy phenyl) propane, Trimethylolpropane triacrylate, a pentaerythritol thoria chestnut rate, - methylenebis acrylamide, p-quinonedioxime, and divinylbenzene, N, and N'p, p'-dibenzoyl quinonedioxime, a triazine thiol, a triaryl SHIANU rate, bismaleimide, etc. are mentioned. These can also mix and use a kind independent or two sorts or more.

[0016] the content of the (X) component in the (A) component in that case -- the (a-1)+(a-2)+(a-3) =100 weight section -- receiving -- 0.1 - 15 weight section -- more -- desirable -- 0.3 - 10 weight section -- it is 0.5 - 5 weight section still more preferably. (X) As for the rubber (henceforth "partial bridge formation rubber") which copolymerized the component, chains construct a bridge. insoluble matter is [in / extent of bridge formation is expressed with the methyl-ethyl-ketone insoluble matter (henceforth "MEK insoluble matter") in 23 degrees C, and / the (A) component of this invention] 20 - 90% still more preferably 15 to 95% preferably 10 to 99% -- it comes out.

[0017] The copolymerization rubber which is contained in the (A) component of this invention and by which hydrogenation was carried out selectively carries out partial hydrogenation of the above-mentioned unsaturated nitrile-conjugated diene system rubber under hydrogen application of pressure using the hydrogenation catalyst of metal complexes, such as nickel, Pd, Pt, Rh, and Ru, or metallic compounds.

[0018] The (A) unsaturated nitrile-conjugated diene system rubber of this invention needs to have two or more glass transition temperature (Tg). Although you may be two or more sorts of unsaturated nitrile-conjugated diene system rubber which has glass transition temperature which there may be two or more glass transition temperature in a single copolymer, and is different, latter one is easy a process and desirable. As for one glass transition temperature, it is desirable between two or more glass transition temperature that it is -50 degrees C or more. - When there is no Tg 50 degrees C or more, oilproof may get worse. As for another glass transition temperature, it is desirable that it is less than -50 degrees C. - When there is no less than 50-degree C Tg, the compatibility with olefin system resin is very bad, and when it is made to distribute in olefin system resin, the distributed particle size of unsaturated nitrile-conjugated diene system rubber becomes large, and is inferior in a mechanical property and a shaping appearance. Moreover, 10 degrees C or more of temperature gradients of the glass transition temperature of a copolymer with a glass transition temperature high between two or more glass transition temperature and the glass transition temperature of a copolymer with a low glass transition temperature (ΔT_g) are 20 degrees C or more still more preferably. When ΔT_g is less than 10 degrees C, the compatibility with olefin system resin is very bad, and when it is made to distribute in olefin system resin, the distributed particle size of unsaturated nitrile-conjugated diene system rubber becomes large, and is inferior in a mechanical property and a shaping appearance.

[0019] Although there is especially no limit in the molecular weight of the (A) unsaturated nitrile-conjugated diene system rubber of this invention, as for Mooney viscosity (1+4,100 degree C of ML(s)), 20-200 are desirable. When Mooney viscosity is lacking in the rubber elasticity of the thermoplastic-elastomer constituent eventually obtained less than by 20 and 200 is exceeded, it is in the inclination which is inferior in the fabricating-operation nature of the thermoplastic-elastomer constituent obtained eventually.

[0020] It can manufacture by mixing the unsaturated nitrile-conjugated diene system rubber from which the single copolymerization rubber which especially a limit does not have, carried out division addition of the conjugated diene and unsaturated nitrile which it is in the case of a polymerization, for example, a monomer, about the approach of manufacturing the (A) unsaturated nitrile-conjugated diene system rubber of this invention at the polymerization system, and attached presentation distribution is sufficient, or glass transition temperature differs. it can manufacture easily by mixing the unsaturated nitrile-conjugated diene system rubber (the following -- "-- (***) -- component" being said) whose content of an unsaturated nitrile unit is 30 - 70 % of the weight, and the unsaturated nitrile-conjugated diene system rubber (the following -- "-- (***) -- component" being said) whose content of an unsaturated nitrile unit is 5 - 25 % of the weight as a desirable mode. In that case, the rate of the above-mentioned unsaturated nitrile-conjugated diene system rubber (**) and unsaturated nitrile-conjugated diene system rubber is a weight ratio ((***) / (**)), and it is desirable that it is 1.5-20. Moreover, when using partial bridge formation rubber, you may be a (b) component, a (b) component, or its both. By using partial bridge formation rubber, the extrusion nature of the thermoplastic-elastomer constituent obtained eventually is improved further. There is especially no limit about the mixed approach of these unsaturated nitrile-conjugated diene system rubber, and the unsaturated nitrile-conjugated diene system rubber of two sorts of latex conditions or a solution condition may be mixed, and two sorts of solid unsaturated nitrile-conjugated diene system rubber may be mixed.

[0021] An emulsion polymerization is common, although there may be no limit especially about the polymerization format of unsaturated nitrile-conjugated diene system rubber itself and any of an emulsion polymerization, a suspension polymerization, solution

polymerization, and a bulk polymerization are sufficient. As a radical polymerization initiator used for a polymerization, for example Benzoyl peroxide, Lauroyl peroxide, cumene hydro peroxide, p-menthonaftene hydro peroxide, Organic peroxide, such as G t-butyl peroxide, azobisisobutyronitril, Azo compounds, such as azobisiso valeronitrile and azobisiso capronitrile, Inorganic peroxides, such as potassium persulfate, ammonium persulfate, and a hydrogen peroxide, The redox system catalyst which consists of said organic peroxide or inorganic peroxide, and reducing agents, such as an organic amine, a ferrous sulfate, a sodium sulfite, a sodium thiosulfate, sodium formaldehyde sulfoxylate, L-ascorbic acid, and a sulfinic acid, can be mentioned.

[0022] Moreover, as an emulsifier used in an emulsion polymerization, although an anion system surface active agent, the Nonion system surface active agent, a cation system surface active agent, an amphoteric surface active agent, etc. can be used, an anion system surface active agent and the Nonion system surface active agent are especially desirable. These surfactants can also be fluorocarbonic surfactants.

[0023] In an emulsion polymerization, in order to adjust the viscosity of the system of reaction, particle diameter, etc., a following suspension stabilizer or a following thickener can also be used with an emulsifier, and they are water-soluble suspension stabilizers, such as polyvinyl alcohol, sodium polyacrylate, a methyl-vinyl-ether-maleic-anhydride copolymer, a water-soluble polyether, hydroxyethyl cellulose, a carboxymethyl cellulose, starch, gelatin, casein, and alginate, as an example. These suspension stabilizers or thickeners may be contained in the thermoplastic-elastomer constituent obtained eventually.

[0024] The loadings of the (A) component of this invention can be more preferably made into 60 - 85 % of the weight still more preferably 55 to 90% of the weight 50 to 95% of the weight, when it is made into 100 % of the weight of total quantities with (B) olefine resin.

(A) There is an inclination for oilproof [of the thermoplastic elastomer eventually obtained as a component is less than 50 % of the weight] to get worse. On the other hand, when it exceeds 95 % of the weight; the content of (B) olefine resin falls, and the phase structure (mol follow G) of the thermoplastic-elastomer constituent obtained eventually does not turn into good sea island structure which is the description of dynamic bridge formation mold thermoplastic elastomer, but there is a possibility that fabricating-operation nature and machine physical properties may get worse.

[0025] As (B) olefine resin (henceforth "B) component") used by olefine resin this invention, the homopolymer or copolymer of an alpha olefin of the carbon atomic numbers 2-20 is mentioned. The following (**) polymers are mentioned as a concrete example of the above-mentioned olefine resin. (1) Ethylene homopolymer (any of low voltage method and high pressure process are sufficient as process) (2) ethylene, Other alpha olefins or vinyl acetate not more than 10 mol %, A copolymer with vinyl monomers, such as ethyl acrylate (3) Propylene homopolymer (4) Propylene A random copolymer with other alpha olefins not more than 20 mol % (5) The random-copolymer (8)4-methyl-1-pentene homopolymer of the block-copolymer (6)1-butene homopolymer (7)1-butene of a propylene and other alpha olefins not more than 30 mol %, and other alpha olefins not more than 10 mol % (9) Specifically as an alpha olefin of the random-copolymer above of 4-methyl-1-pentene and other alpha olefins not more than 20 mol %, ethylene, a propylene, 1-butene, 4-methyl-1-pentene, 1-hexene, 1-octene, etc. are mentioned. Also in the above-mentioned olefine resin, a propylene homopolymer and especially the random copolymer of a propylene and other alpha olefins not more than 20 mol % are desirable. The above olefine resin is independent, or can be combined and used.

[0026] When the olefine resin used by this invention is crystalline olefine resin, the degree of

crystallinity for which it asked with X wire method is usually 55% or more of thing preferably 50% or more. Moreover, as for the maximum peak temperature by the differential scanning calorimetry of the above-mentioned crystalline olefine resin with desirable making a consistency into 0.90 - 0.94 g/cm³ more preferably three or more 0.89 g/cm, i.e., the melting point, (only henceforth "T_m"), it is desirable that it is 100 degrees C or more (preferably 120 degrees C or more). T_m is in the inclination for thermal resistance and a mechanical strength sufficient at less than 100 degrees C not to be demonstrated. moreover, a melt flow rate (only henceforth "MFR") (it can set against the temperature of 230 degrees C, and 2.16kg of loads) -- desirable -- 0.1-100g/ -- they are 0.5-80g / 10 minutes more preferably for 10 minutes. It is in the inclination for MFR to become inadequate [the kneading workability of an elastomer constituent, extrusion nature, etc.] in 0.1g / less than 10 minutes. On the other hand, when it exceeds 100g / 10 minutes, it is in the inclination for reinforcement to fall.

[0027] Therefore, the olefine resin used by this invention has especially the desirable thing for which crystallinity uses the copolymer of the polypropylene and/or the propylene whose MFRs are 0.1-100g / 10 minutes, and whose melting point consistencies are three or more 0.89 g/cm, the content of an ethylene unit is less than [20 mol %], T_m is 100 degrees C or more, and is 140-170 degrees C, and ethylene 50% or more.

[0028] As olefine resin, amorphous olefine resin can also be used in addition to the above-mentioned crystalline olefine resin. As amorphous olefine resin, homopolymers, such as atactic polypropylene and atactic poly1 butene, a propylene (more than 50 mol % content) and other alpha olefins (ethylene --) 1-butene, 1-pentene, 1-hexene, 4-methyl-1-pentene, A copolymer with 1-octene, 1-decene, etc., the copolymer of 1-butene (more than 50 mol % content) and other alpha olefins (ethylene, a propylene, 1-pentene, 1-hexene, 4-methyl-1-pentene, 1-octene, 1-decene, etc.), etc. are mentioned.

[0029] 50000 or less cSts of melt viscosity in 190 degrees C of amorphous olefine resin are 200-20000cSt still more preferably 100 to 30000 cSt preferably. Furthermore, the degree of crystallinity by X diffraction measurement is 20% or less more preferably 30% or less less than 50%. As for a consistency, it is desirable 0.85 - 0.89 g/cm³ and that it is 0.85 - 0.88 g/cm³ more preferably. Furthermore, as for the number average molecular weight Mn of amorphous olefine resin, it is desirable that it is 1000-20000 (preferably 1500-15000).

Usually, only either may be used for it; although amorphous olefine resin is used together with crystalline olefine resin and used.

[0030] When the rate of the (B) component in a thermoplastic-elastomer constituent makes the total quantity of (A) and (B) 100 % of the weight, it is 15 - 40 % of the weight still more preferably ten to 45% of the weight preferably five to 50% of the weight. If the phase structure (mol follow G) of the thermoplastic-elastomer constituent eventually obtained at less than 5 % of the weight does not turn into good sea island structure which is the description of dynamic bridge formation mold thermoplastic elastomer, but there is a possibility that fabricating-operation nature and machine physical properties may get worse and 50 % of the weight is exceeded, the flexibility and rubber elasticity of thermoplastic elastomer which are obtained eventually fall and are not desirable.

[0031] A softener and/or the thermoplastic-elastomer constituent of plasticizer this invention can blend the softener and/or plasticizer other than the above-mentioned (A) component and the (B) component if needed further. A vegetable oil system softener like an aroma tick oil, a naphthene oil, a paraffin oil, White oil, a petroleum system softener like gilsonite, castor oil, cotton seed oil, oleum rapae, palm oil, coconut oil, and rosin as a softener used for this invention is mentioned. As a plasticizer used for this invention,

moreover, dimethyl phthalate, diethyl phthalate, Dibutyl phthalate, diisobutyl phthalate, dioctyl phthalate, Butyl octyl phthalate, G (2-ethylhexyl) phthalate, Phthalic ester, such as G soak chill phthalate and di-isodecyl phthalate A dimethyl horse mackerel peat, a diisobutyl horse mackerel peat, a G (2-ethylhexyl) horse mackerel peat, A JIISO octyl horse mackerel peat, di-isodecyl adipate, an octyl DESHIRU horse mackerel peat, G (2-ethylhexyl) azelate, G soak chill azelate, Diisobutyl azelate, dibutyl sebacate, G (2-ethylhexyl) sebacate, Fatty acid ester, such as G soak chill sebacate, trimellitic acid isodecyl ester, Trimellitic acid octyl ester, trimellitic acid n-octyl ester, Others [ester /, such as trimellitic acid system iso nonyl ester / trimellitic acid], G (2-ethylhexyl) fumarate, diethylene-glycol mono-olate, Plasticizers, such as glyceryl mono-triricinolate, trilauryl phosphate, tris TEARIRU phosphate, tree (2-ethylhexyl) phosphate, tricresyl phosphate, epoxidized soybean oil, and polyether ester, are mentioned. In carrying out this invention, the above-mentioned softener and/or a plasticizer can use together independent or two sorts or more. Moreover, you may add for the (A) component and the (B) component at the time of thermoplastic-elastomer constituent manufacture, and the above-mentioned softener and/or a plasticizer may be added at the time of the polymerization of the (A) component.

[0032] The loadings of the above-mentioned softener and/or a plasticizer can be made per total quantity 100 weight section of the (A) component and the (B) component, and into below the 100 weight sections, and can be more preferably made below into 90 weight sections below 95 weight sections. When the 100 weight sections are exceeded, a softener carries out bleed out from the thermoplastic-elastomer constituent obtained eventually, or it is in the inclination for a mechanical strength and rubber elasticity to fall.

[0033] The thermoplastic-elastomer constituent of other polymer this inventions can blend other polymers other than the above-mentioned (A) component and the (B) component if needed further. As other polymers used for this invention, it is ethylene and alpha olefin system random copolymerization rubber, isobutylene isoprene rubber, acrylic rubber, halogenation polyolefine rubber, and cis- - It is 1, 4-polybutadiene, and cis- - 1, 4-polyisoprene, 1, 2-polybutadiene, a styrene-butadiene random copolymer, a styrene-butadiene block copolymer, a styrene-isoprene block copolymer, a hydrogenation diene system polymer, acrylate (meta) resin, etc. are mentioned.

[0034] The cross linking agent used in cross linking agent this invention is the compound which can construct a bridge in at least one sort of unsaturated nitrile-conjugated diene system rubber in a constituent by dynamic heat treatment in the temperature more than the melting point of the above-mentioned olefine resin. As such a cross linking agent, the derivative of organic peroxide, a phenol system cross linking agent, sulfur, a sulfur compound, p-quinone, and p-quinonedioxime, a bismaleimide compound, an epoxy compound, a silane compound, amino resin, etc. can be mentioned, and organic peroxide and a phenol system cross linking agent are especially desirable. As the above-mentioned organic peroxide, for example 1, 3-bis(t-butyl PAOKI seesaw propyl) benzene, 2, the 5-dimethyl -2, 5-bis(tert-butyl peroxide) hexyne - 3, 2, the 5-dimethyl -2, 5-bis(tert-butyl peroxide) hexene - 3, 2, the 5-dimethyl -2, a 5-bis(tert-butyl peroxide) hexane, 2 and 2'-bis(tert-butyl peroxide)-p-isopropylbenzene, JIKUMIRU peroxide, G t-butyl peroxide, t-butyl peroxide, p-menthonaphtene peroxide, 1, and 1-screw (tert-butyl peroxide) - 3, 3, a 5-trimethyl cyclohexane, JIRAU roil peroxide, diacetyl peroxide, t-butyl peroxybenzoate, 2, 4-dichlorobenzoyl peroxide, p-chlorobenzoyl, Benzoyl peroxide, di-tert-butyl peroxide par benzoate, n-butyl -4, 4-bis(tert-butyl peroxide) valerate, t-butylperoxyisopropylcarbonate, etc. can be mentioned. 1 among these organic peroxide, 3-bis(t-butyl PAOKI seesaw propyl) benzene, 2, the 5-dimethyl -2, 5-di-tert-butyl peroxide hexyne - A compound with

comparatively high decomposition temperature, such as 3, 2, the 5-dimethyl -2, and 5-di-tert-butyl peroxide hexane, is desirable.

[0035] The above-mentioned organic peroxide is independent, or two or more sorts can be mixed and used for it. In this invention, homogeneity and moderate crosslinking reaction can be performed by using the above-mentioned organic peroxide together with a suitable bridge formation assistant. As such a bridge formation assistant, for example Powder sulfur, colloid sulfur, precipitated sulfur, Sulfur or sulfur compound; p-quinone oximes, such as insoluble sulfur, surface-preparation sulfur, and dipentamethylenethiuramtetrasulfide, Oxime compounds, such as a p and p'-dibenzoyl quinone oxime; Ethylene GURIKORUJI (meta) acrylate, Diethylene GURIKORUJI (tneta) acrylate, TORIECHIRENGURIKORUJI (meta) acrylate, Tetra-ethylene GURIKORUJI (meta) acrylate, polyethylene GURIKORUJI (meta) acrylate, TORIMECHI roll pro pantry (meta) acrylate, diallyl phthalate, Polyfunctional monomers, such as -m-phenylene bismaleimide, and N'N, N'-toluylene bismaleimide, a maleic anhydride, a divinylbenzene, and JI (meta) acrylic-acid zinc, can be mentioned. [tetra-allyloxy ethane a triaryl SHIANU rate, N, and] p,- dibenzoyl quinone oxime, and p'N, N'-m-phenylene bismaleimide, and a divinylbenzene are desirable among these bridge formation assistants. In addition, even if N and N'-m-phenylene bismaleimide is independent, it can act as a cross linking agent. The above-mentioned bridge formation assistant is independent, or two or more sorts can be mixed and used for it.

[0036] As the above-mentioned phenol system cross linking agent, the condensate of the p-permutation phenol and the aldehyde (preferably formaldehyde) under existence of an alkali catalyst, the condensate of o-permutation phenol and an aldehyde, the condensate of m-permutation phenol and an aldehyde, the condensate of bromination alkylphenol and an aldehyde, etc. can be mentioned. p-permutation phenol system compound is desirable especially. This p-permutation phenol system compound is used as a rubber frame-common-equipment pons agent from the former as indicated by the U.S. Pat. No. 3287440 description and the U.S. Pat. No. 3709840 description.

[0037] Even if the above-mentioned phenol system cross linking agent is independent, it can be used, but since a bridge formation rate is adjusted, it can also use together with a bridge formation accelerator. as such a bridge formation accelerator -- metal halogenide; chlorination polypropylene, such as for example, the first tin of chlorination, and a ferric chloride, and bromination -- organic halogenides, such as isobutylene isoprene rubber and chloroprene rubber, etc. can be mentioned. Furthermore, it is more desirable to use together dispersants, such as metallic oxides, such as a zinc oxide, and stearin acid.

[0038] the case where these cross linking agents use organic peroxide -- the amount used -- the mixture 100 weight section of the above (A) and the (B) component -- receiving -- desirable -- 0.05 - 10 weight section -- it can consider as 0.1 - 5 weight section more preferably. There is a possibility that the rubber elasticity and the mechanical strength of a thermoplastic-elastomer constituent which degrees of cross linking run short that the amount of the organic peroxide used is under the 0.05 weight section, and are obtained eventually may fall. On the other hand, when 10 weight sections are exceeded, a degree of cross linking becomes high too much, and fabricating-operation nature gets worse or it is in the inclination for a mechanical property to fall. Moreover, the amount of the bridge formation assistant used in the case of using organic peroxide as a cross linking agent can be more preferably made into 0.2 - 5 weight section below 10 weight sections to the mixture 100 weight section of the above (A) and the (B) component. When the amount of the bridge formation assistant used exceeds 10 weight sections, a degree of cross linking becomes high too much, and fabricating-operation nature gets worse or it is in the inclination for a

mechanical property to fall.

[0039] the case where a phenol system cross linking agent is used as a cross linking agent -- the mixture 100 weight section of the above (A) and the (B) component -- receiving -- desirable -- 0.2 - 10 weight section -- it can consider as 0.5 - 5 weight section more preferably. It is in the inclination for the elastic recovery nature of a Plastic solid to fall that the amount of the phenol system cross linking agent used is under the 0.2 weight section.

On the other hand, when 10 weight sections are exceeded, it is in the inclination for extrusion nature, injection workability, etc. of a thermoplastic-elastomer constituent to fall.

[0040] Although the thermoplastic-elastomer constituent of process this invention of a thermoplastic-elastomer constituent may be obtained by what kind of approach, a cross linking agent, a bridge formation assistant, etc. can be added into the mixture (the first process) containing the (A) component of the specified quantity, and the (B) component, and the thermoplastic-elastomer constituent equipped with the property which was excellent what dynamic heat treatment is performed for (the second process) can be obtained, for example. Moreover, it can also obtain by heat-treating dynamically the mixture containing the (A) component of the specified quantity, the (B) component, and a cross linking agent. in addition, the case where what was manufactured when the (A) component mixed two sorts of unsaturated nitrile-conjugated diene system rubber from which Tg differs is used -- beforehand -- the above-mentioned (**) and (**) -- the thing and the (B) component which mixed the component -- you may mix -- or (**) -- a component and (**) -- a component and the (B) component may be mixed simultaneously.

[0041] In addition, it says that "dynamic heat treatment" performs applying shearing force and heating [both]. This dynamic heat treatment can be performed for example, using melting kneading equipment. Among these, as equipment which can knead, equipments, such as the roll mill of an open sand mold, a Banbury mixer of a non-open sand mold, a kneader, a continuous system extruder; 1 shaft extruder, the said direction revolution mold continuous system twin screw extruder, and a different direction revolution mold continuous system 2 shaft kneading machine, can be mentioned, for example. Moreover, as for the processing performed with this kneading equipment, a batch type may also be continuous system.

[0042] Although the processing conditions of dynamic heat treatment in this invention change with the melting point of the olefine resin to be used, the class of cross linking agent, kneading formats, etc., as for processing temperature, it is desirable that it is 120-350 degrees C (preferably 150-290 degrees C), and, as for the processing time, it is desirable that it is 20 seconds - 20 minutes (preferably 30 seconds - 15 minutes). As for the shearing force to apply, it is desirable to consider as a 10-2000-/second (preferably 100-1000-/second) with a shear rate.

[0043] It responds to the thermoplastic-elastomer constituent of this invention at the need. Various additives, For example, lubricant, an antioxidant, a thermostabilizer, a weathering agent, metal deactivator, an ultraviolet ray absorbent, Stabilizers, such as light stabilizer and copper inhibitor, an antimicrobe and an antifungal agent, a dispersant, a plasticizer, Coloring agents, such as a crystalline-germ agent, a flame retarder, a tackifier, a foaming assistant, titanium oxide, and carbon black, Inorganic fibers, such as metal powder, such as a ferrite, a glass fiber, and a metal fiber, Inorganic whiskers, such as organic fiber, such as a carbon fiber and an aramid fiber, a bicomponent fiber, and a potassium titanate whisker, A glass bead, glass balun, a glass flake, asbestos, a mica, A calcium carbonate, talc, a silica, a calcium silicate, a hydrotalcite, A kaolin, diatomite, graphite, a pumice, EBO powder, cotton flocks, Bulking agents, such as bulking agents, such as cork powder, a barium sulfate, a fluororesin,

and a polymer bead, or such mixture, a polyolefine wax, cellulose powder, rubber powder, and wood flour, a low-molecular-weight polymer, etc. can be blended and used.

[0044] Processing by injection molding, extrusion molding, blow molding, compression molding, the vacuum forming, laminate molding, calender shaping, etc. becomes easy, and the thermoplastic-elastomer constituent of this invention can obtain thermoplastic-elastomer mold goods excellent in rubber elasticity and mechanical physical properties.

[0045] The thermoplastic-elastomer constituent of this invention is used taking advantage of oilproof, the outstanding flexibility, and outstanding fabricating-operation nature suitable for manufacture of the components of industrial parts, such as hose, such as an oil hose, a fuel hose, a gas hose, and a brake hose, coverings of these hose, packing, a gasket, an O ring, a belt, lining, oil seal, and a dust boot, the aircraft, and an automobile. Moreover, the bumper of the automobile by which conventional thermoplastic elastomer is used, The mall for sheathing, the gasket for window seals, the gasket for door sealing, The gasket for trunk seals, a roof side rail, an emblem, an inner panel, Inner sheathing epidermis material, such as a console box, a weather strip, a leather sheet, Sealants engineering works and for a building, such as a sealant the aircraft and for marine vessels, and inner sheathing epidermis material, It can use also for common workpieces, such as medical-application device components, such as packing or housing of weak-electric-current components, such as sealants a general instrument and for equipments, such as inner sheathing epidermis material or tarpaulin material, an electric wire, a general cargo article for days, and sporting goods, broadly.

[0046]

[Embodiment of the Invention] Hereafter, although an example explains this invention, this invention is not limited to these.

At a rate which shows the unsaturated nitrile-conjugated diene system rubber shown below in preparation of a thermoplastic-elastomer constituent, olefine resin, a plasticizer, a cross linking agent, and other additives in a table 1, two sorts of dynamic heat treatment approaches shown below were given, and the thermoplastic-elastomer constituent was obtained.

[0047] (1) Unsaturated nitrile-conjugated diene system rubber was compounded by the approach of the publication below unsaturated nitrile-conjugated diene system rubber. In addition, various kinds of measurement depended on the following approach.

** Unsaturated nitrile (AN) content : it asked with the Coleman nitrogen analyzer.

** MEK insoluble matter (%) : put about 0.2g polymer crumb into the box of the wire gauze made from stainless steel of 200 meshes of weight known, it is immersed in the beaker into which the 80ml methyl ethyl ketone went this box, cover with aluminum foil, and dry this box under reduced pressure (750mmHg) at ejection and 40 degrees C after 24-hour standing and immersion for 4 hours. The weight of the sample before and behind immersion was measured, and it asked for MEK insoluble matter (%) by the following formula. MEK insoluble matter (% of the weight) = $(W' - W) / W \times 100$ (weight of the sample of which W:extraction was done, W': weight after immersion)

** Glass transition temperature (Tg) : using DSC2910 by the tee ray instrument company, temperature up was carried out from -100 degrees C to 100 degrees C with 10-degree-C programming rate for /, and glass transition temperature was measured.

** the Mooney viscosity of a Mooney viscosity (1+4,100 degree C of ML(s)):(A) component is automatic -- MUNIBISUKOMETTA SMV-201 (Shimadzu make) -- using -- JIS Based on K6300, it had under 100-degree C temperature conditions, and Mooney viscosity was measured.

[0048] Into the autoclave of 20l. of synthetic inner capacity of unsaturated nitrile-conjugated

diene system rubber, the water 250 weight section, the sodium dodecylbenzenesulfonate 5 weight section, the butadiene (it omits Following BD) 66 weight section, the acrylonitrile (it omits Following AN) 34 weight section and the t-dodecyl mercaptan (it omits Following TDM) 0.5 weight section, the potassium persulfate 0.27 weight section, the cyanoethylation diethanolamine 0.15 weight section, and the potassium-hydroxide 0.10 weight section were taught, and the polymerization was started at 20 degrees C. After reaching 80% of conversion, the diethylhydroxylamine of the 0.2 weight section was added per monomer 100 weight section, and the polymerization was stopped. Subsequently, after heating and removing a residual monomer in steam distillation, the alkylation phenol 1 weight section was added as an antioxidant per rubber solid content 100 weight section, and it solidified in the calcium chloride water solution. After rinsing the obtained crumb, NBR1 was compounded by carrying out a vacuum drying at 50 degrees C. For AN content, MEK insoluble matter was [obtained NBR1 / -29 degree C and Mooney viscosity (1+4,100 degree C of ML(s)) of Tg] 72 0% 34% of the weight. NBR2-NBR3 which change the charge of a monomer according to NBR1, and are shown in a table 1 were obtained.

[0049]

[A table 1]

		NBR 1	NBR 2	NBR 3
共重合組成	BD	6 6	6 5	8 5
	AN	3 4	3 5	1 5
	ジビニルベンゼン	0	0. 5	0
MEK不溶分 (%)		—	9 0	—
Tg (°C)		—2 9	—2 7	—6 2. 5
ムーニー粘度		7 2	6 0	6 2

[0050] (2) Olefine resin olefine resin 1 : a polypropylene polymer, consistency 0.90 g/cm³, MFR(temperature [of 230 degrees C], 2.16kg of loads)3g/10min, the Japan Polychem make, a name of article "nova tech PP MA4"

(3) Additive plasticizer 1 : a dibutyl carbitol horse mackerel peat, the Asahi Denka Kogyo K.K. make, a name of article "RS-107"

Plasticizer 2: Trimellitic acid ester, Asahi Denka Kogyo stock company make, a name of article "CN-79"

A cross linking agent 1:2, the 5-dimethyl -2, 5-di-tert-butyl peroxide hexane, the Nippon Oil & Fats Co., Ltd. make, a name of article "par hexa 25B-40"

Cross linking agent 2: A divinylbenzene (56% of purity), Sankyo Chemicals antioxidant:pentaerythritol-tetrakis [3-(3, 5-G tertiarybutyl-4-hydroxyphenyl) propionate]

[0051] It supplied to the 10l. double arm mold pressurized kneader (product made from MORIYAMA) which heated in the 29 sections as the 64 sections, the seven (NBR3) sections, and (B) olefine resin (olefine resin 1), and heated the 43 sections and the antioxidant 0.3 section at 150 degrees C as a plasticizer (plasticizer 1) as example 1(A) unsaturated nitrile-conjugated diene system rubber (NBR1), and kneaded for 20 minutes by 40rpm. Then, the constituent of a melting condition was pelletized in feeder RUDA (product made from MORIYAMA) set as 180 degrees C and 40rpm. Furthermore, the two

sections are blended with the obtained pellet object as a cross linking agent as the 1.4 (cross linking agent 1) sections and a bridge formation assistant (cross linking agent 2). a Henschel mixer -- 30-second mixing and a twin screw extruder (the IKEGAI CORP. make and a type "PCM-45" --) It uses. ratio of length to diameter which is the said direction full engagement mold screw, and is the ratio of die-length L of the screw flight section, and screw-diameter D -- 38.5 -- it is -- It extruded performing dynamic heat treatment on the conditions which pile up for 2 minutes by 230 degrees C and 300rpm, and the dynamic bridge formation mold thermoplastic-elastomer constituent of a pellet type was obtained.

[0052] injection molding was performed for the pellet of the test piece production profit **** thermoplastic elastomer of thermoplastic elastomer using the injection molding machine (a trade name N-100, Japanese-made steel company make), the sheet with the thickness of 2mm, a die length [of 120mm], and a width of face of 120mm was produced, and various assessment was presented.

[0053] it was measured by 230 degrees C and 10kg load, having used the fluidity of the assessment profit **** thermoplastic elastomer of thermoplastic elastomer as the melt flow rate, and was described in a table 2. Moreover, using the shaping sheet of the obtained thermoplastic elastomer, the following approach estimated respectively a degree of hardness, a mechanical property (**** breaking strength, **** elongation after fracture), rubber elasticity, and oilproof, and it described them in a table 2.

** Degree of hardness : based on JIS-K6253, it measured as an index of flexibility.

** **** breaking strength and **** elongation after fracture : it measured based on JIS-K6251.

** Compression set : based on JIS-K6262, it carried out as an index of rubber elasticity in 70 degrees C of Measuring conditions, and 22 hours.

** Oilproof : it is based on JIS-K6258 and they are an IRM903 trial oil and Fuel. 120 degrees C and the volume change (deltaV) by the 70-hour immersion test were measured using C trial oil.

[0054] Using the lab PURASUTO mill extruder (outer diameter = 20mm, ratio-of-length-to-diameter(ratio of screw effective length L and outer diameter D) =25) by the assessment Oriental energy machine company of the fabricating-operation nature of a thermoplastic-elastomer constituent, plate extrusion (mouthpiece **** of 25mm, thickness of 1.5mm) was performed on the following conditions, and viewing estimated the appearance. The front face was smooth and the edge **** thing was taken [all of O or O (however, O>O), and except for it] as x.

Cylinder C1=190 degree-C cylinder C2=190 degree-C cylinder C3=200 degree-C die =190 degree-C screw speed = 30rpm [0055] The bridge formation mold thermoplastic-elastomer constituent of a pellet type and test piece production were obtained like the example 1 by the blending ratio of coal shown in one to examples 2-3 and example of comparison 3 table 2. The assessment result of the obtained thermoplastic-elastomer constituent is shown in a table 2.

[0056]

[A table 2]

		実施例			比較例		
		1	2	3	1	2	3
配合割合	NBR1	64	36				64
	NBR2		36	75	81	8	
	NBR3	7	7	6		73	7
	オレフィン樹脂1	29	21	19	19	19	29
	可塑剤1	43	43				43
	可塑剤2			25	25	25	
	架橋剤1	1.4	1.4	1.4	1.4	1.4	
	架橋剤2	2	2	2	2	2	
評価結果	老化防止剤	0.3	0.3	0.3	0.3	0.3	0.3
	MFR[g/10min]	31	24	36	48	5	7
	硬度(デュロA)	83	78	77	78	81	81
	引張り破断強度[MPa]	7.6	5.5	5.5	4.9	4.9	3.6
	引張り破断伸び[%]	250	230	230	160	170	890
	圧縮永久変形[%]	49	44	41	44	31	85
	耐油性(△V);IRM903	-5	-5	3.2	-0.4	52	1.3
	耐油性(△V);FuelC	27	28	40	35	110	33
押出成形性		○	◎	○	×	○	×

[0057] A table 2 shows that examples 1-3 are excellent in oilproof, a mechanical property, rubber elasticity (low compression set), and fabricating-operation nature. There is only one glass transition temperature which is the description of this invention, and the unsaturated nitrile-conjugated diene system rubber of the example 1 of a comparison is inferior in a mechanical property, rubber elasticity, and fabricating-operation nature. An unsaturated nitrile content is 17 % of the weight, and since it separates from the unsaturated nitrile-conjugated diene system rubber of the example 2 of a comparison from the range of this invention, it is inferior to oilproof. Moreover, since dynamic bridge formation of the example 3 of a comparison has not been carried out, it is inferior in a mechanical property and rubber elasticity.

[0058]

[Effect of the Invention] The thermoplastic-elastomer constituent of this invention is excellent in oilproof, is a low compression set and is used taking advantage of fabricating-operation nature being good suitable for manufacture of the components of industrial parts, such as hose, such as an oil hose, a fuel hose, a gas hose, and a brake hose, coverings of these hose, packing, a gasket, an O ring, a belt, lining, oil seal, and a dust boot, the aircraft, and an automobile. Moreover, especially conventional thermoplastic elastomer olefin is used, it can be used suitable for shaping components, such as housing of - exterior parts and weak-electric-current components, a leather sheet product, etc. among the weather strip of an automobile, sponge, a mall, etc.

[Translation done.]

CLAIMS

[Claim(s)]

[Claim 1] (A) The thermoplastic-elastomer constituent which has two or more glass transition temperature, and is characterized by heat-treating dynamically the unsaturated nitrile-conjugated diene system rubber whose content of an unsaturated nitrile unit is 25 - 50 % of the weight, and the mixture containing (B) olefine resin under existence of a cross linking agent, and being obtained.

[Claim 2] The thermoplastic-elastomer constituent according to claim 1 which the unsaturated nitrile-conjugated diene system rubber 50 (above-mentioned [A]) - 50 - 5 % of the weight (correcting the total quantity of (A) and (B) is 100 % of the weight) of 95-% of the weight and (B) olefine resin come to contain.

[Claim 3] The unsaturated nitrile-conjugated diene system rubber (above-mentioned [A]) is a thermoplastic-elastomer constituent according to claim 1 or 2 characterized by consisting of unsaturated nitrile-conjugated diene system rubber (b) whose content of an unsaturated nitrile unit is 30 - 70 % of the weight, and unsaturated nitrile-conjugated diene system rubber (b) whose content of an unsaturated nitrile unit is 5 - 25 % of the weight.

[Claim 4] The rate of the above-mentioned unsaturated nitrile-conjugated diene system rubber (**) and unsaturated nitrile-conjugated diene system rubber (**) is a thermoplastic-elastomer constituent according to claim 3 characterized by being a weight ratio ((**)/(**)) and being 1.5-20.

[Claim 5] The unsaturated nitrile-conjugated diene system rubber (above-mentioned [A]) is a thermoplastic-elastomer constituent according to claim 1 to 4 characterized by the methyl-ethyl-ketone insoluble matter in 23 degrees C being 10 - 99%.

[Claim 6] Mold goods which come to contain the thermoplastic-elastomer constituent of a publication in any 1 term of claims 1-5.

[Translation done.]